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In the United States Patent and Trademark Office
Board of Patent Appeals and Interferences

In re Application of:

Ronald S. Cok

Active Matrix Organic Light Emitting Diode Flat-Panel Display

Serial No. 09/858,109

Filed May 15, 2001

Group Art Unit: 2675

Examiner: Paul A. Bell

I hereby certify that this correspondence is being deposited today with the United States Postal Service as first class mail in an envelope addressed to Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Valerie J. Richardson

Valerie J. Richardson

June 30, 2004

Date

Mail Stop AF
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

APPEAL BRIEF TRANSMITTAL

Enclosed herewith in triplicate is Appellants' Appeal Brief for the above-identified application.

The Assistant Commissioner is hereby authorized to charge the Appeal Brief filing fee to Deposit Account 05-0225. A duplicate copy of this letter is enclosed.

Respectfully submitted,

Attorney for Appellants
Registration No. 33,564

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APPEAL BRIEF PURSUANT TO 37 C.F.R. 1.192

Applicants hereby appeal to the Board of Patent Appeals and Interferences from the Examiner's Final Rejection of claims 1-9, 11, and 12 which was contained in the Office Action mailed January 28, 2004.

A timely Notice of Appeal was filed April 30, 2004 (with certificate of first class mailing date of April 28, 2004).

Respectfully submitted,

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Real Party In Interest

The Eastman Kodak Company is the assignee and the real party in interest.

Related Appeals And Interferences

No appeals or interferences are known which will directly affect or be directly affected by or have bearing on the Board's decision in the pending appeal.

Status Of The Claims

Claims 1, 3-9, 11 and 12 are pending in the application.

Claims 2, 10 and 13-16 have been cancelled.

Claims 1, 3-9, 11 and 12 stand rejected under 35 USC § 103.

Appendix I provides a clean, double spaced copy of the claims on appeal.

Status Of Amendments

A Response After Final requesting reconsideration of the final rejection was filed April 28, 2004. An Advisory Action was then received dated May 20, 2004 stating that Applicant's agruments have been considered but does not place the application in condition for allowance.

Summary Of The Invention

The present claimed invention relates to active matrix organic light emitting diode (OLED) flat-panel color displays (12) that include a plurality of light emitting elements (15, 16, 17) for emitting light of different colors and associated control circuits (page 1, lines 25-32); a programmable power supply (21, 22, 23) connected to the control circuits; a separate sensor (25, 26, 27) for sensing each color of light emitted by the display to produce a feedback signal for each color; and a

display controller (18) responsive to the feedback signal for programming the programmable power supply to compensate for changes in the light output from the light emitting elements. The invention advantageously enables correction of aging effects for a set of light emitting elements of the display (e.g., all the light emitting elements of a particular color) by controlling a programmable power supply connected to the control circuits of the set of light emitting elements in response to the sensed performance of a representative colored light emitting element associated with a

Issues For Review By The Board

There is one issue presented for review by the Board of Patent Appeals and Interferences:

1. Are Claims 1, 3-9, 11 and 12 properly rejected under 35 U.S.C. 103(a) as being unpatentable over Shen et al. (6,414,661) in view of Hunter (6,441,560) and Yano et al. (6,317,138)?

Grouping Of Claims

Claims 1, 3-9, 11 and 12 will stand or fall as a single group.

Arguments

The Rejection

Claims 1, 3-9, 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shen et al. (6,414,661) in view of Hunter (6,441,560) and Yano et al. (6,317,138).

With regard to claims 1 and 9, the Examiner states that Shen et al. teaches an active matrix OLED flat-panel color display (column 1, lines 10-49), comprising: a) a plurality of light emitting elements and associated control circuits (figure 2, items 10 and 14); b) a programmable power supply connected to the control circuits (figure 2 and 3); c) a sensor for sensing the light to produce a feedback signal (figure 4a and column 9, lines 10-47); and d) a display controller responsive to the respective feedback signal for programming the programmable power supply to

compensate for changes in the light output from the light emitting elements (figure 4a, item 30), and that it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Shen et al. apparatus to have a separate sensor for each light emitting element mounted on a common substrate as taught by Hunter because one would be motivated to replace a moving single sensor with stationary multiple sensors to speed up and facilitate real-time calibration and control. The Examiner also states it would have been obvious to one of ordinary skill in the art at the time the invention was made to further modify the Shen et al. apparatus as modified by Hunter to have "plurality of light emitting elements for emitting light of **different** colors", as taught by Yano et al. because one would be motivated to produce a multi color display over a single color display in order to display more than one color in a multi color display also multi color displays are more commercially marketable. Reversal of this rejection is respectfully requested for the following reasons.

Contrary to the Examiner's initial description of Shen et al., there is no teaching therein of a programmable power supply connected to control circuits associated with a plurality of light emitting elements as required by the present claimed invention. As used in the present invention, the use of a programmable power supply is a distinct requirement from the use of control circuits associated with individual light emitting elements for providing individual control of the light emitting elements as is well knownin the art (page 1, lines 25-32). Such feature of Applicants' claimed invention advantageously allows for compensation for changes in light output of all a set of light emitting elements (e.g., for all light emitting elements of a particular color), as discussed at page 4, lines 1-11. Figures 2 and 3 of Shen et al. referenced by the Examiner are entirely void of any such teaching. Shen et al. does demonstrate a feedback concept, but not feedback to a programmable power supply connected to control circuits for a plurality of light emitting elements. Rather than employ a programmable power supply, Shen et al. employs a constant power supply for all light emitting elements, and compensates for aging effects by calculating correction coefficients for individual pixel drive currents to control the output of individual pixels through the individual control circuits associated with each pixel element. The actual power supply of the display device in Shen et al is not being programmed in response to the sensed light output.

For clarity, it is noted that the variable voltage source 37 in Fig. 3 of Shen et al is not a programmable power supply, but rather is used to provide a correction signal for each pixel (see, e.g., col. 6, line 54 to col. 7, line 15). Further in such regard, note that the output signal from Fig. 3 is a digital signal, which cannot be used as a power supply. The additional references of Hunter et al and Yano et al. also fail to teach the use of a programmable power supply in combination with a feedback signal for programming a programmable power supply to compensate for changes in the light output from the light emitting elements. Thus, even if the modifications of Shen et al. proposed as being "obvious" by the Examiner in view of the secondary references were to be made, Applicants' claimed invention simply would not be obtained. Accordingly, it is respectfully submitted that a prima facie case of obviousness has not been established. Rather, as there is no suggestion in any of the cited prior art of employing a programmable power supply in combination with a display controller responsive to feedback signals produced by separate light sensors for each color of light, the rejection is clearly made only with the impermissible use of hindsight.

While agreeing with applicants' argument that "Hunter does not discuss a color display device nor does he show a programmable power supply for driving the display", the Examiner states that he fails to see the relevance since Hunter which is a secondary reference from the analogous display art is being only used to teach the concept of, "a separate sensor for each light emitting element", to modify the primary reference Shen et al. Such statement, however, is in fact relevant as the primary reference Shen et al also fails to teach such programmable power supply feature as discussed above. In further response to applicant's argument that the references fail to show certain features of applicant's invention, the Examiner states that the features upon which applicant relies (i.e., "correcting different colors in the display elements") are not recited in the rejected claim 1. Applicants contend that such feature is in fact essentially recited in claim 1, as the claim requires separate sensors for sensing each color of light emitted by the display to produce feed back signals for each color, and a display controller responsive to the respective feedback signals for programming a programmable power supply to compensate for changes in the light output from the light emitters.

In response to applicant's argument that the Examiner's conclusion of obviousness is based upon improper hindsight reasoning, the Examiner states it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning, and that so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. It is respectfully urged, however, that the proposed reconstruction is not so properly limited only to the prior art teachings, as there is no teaching anywhere in the cited art with respect to employing a feedback signal in combination with use of a programmable power supply as required in the present claimed invention. Such feature is only suggested by Applicants' teachings, and the rejection is accordingly improper.

Finally, in response to applicants' request for reconsideration after final, the Examiner states that Shen et al. does teach the concept of a "programmable power supply" when considering the combination of parts illustrated in Figures 2 and 3, as it shows "feedback", calculations based on feedback, and changes which cause different power coming to each LED. As explained above, however, the power supply employed during the individual pixel calibrations performed in Shen et al is actually maintained constant, rather than programmed in response to any sensed feedback signal. Again, it is only the individual drive currents applied to each individual pixel that are changed based on the sensed feed back signals, rather than a programmable power supplied connected to the control circuits of the individual pixel elements.

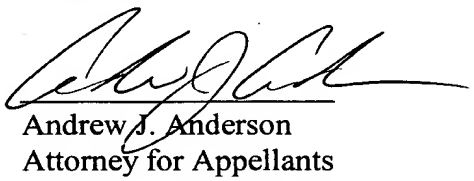
Summary

The Examiner has failed to establish a prima facie case of obviousness as the combination of Shen et al. (6,414,661) in view of Hunter (6,441,560) and Yano et al. (6,317,138) clearly fails to disclose, teach or suggest controlling a programmable power supply connected to control circuits for a plurality of light emitting elements of a color display in response to feedback signals produced from separate sensors that sense each color of light emitted by the light emitting elements in order to compensate for changes in the light output from the light emitting elements.

Conclusion

For the above reasons, Appellants respectfully request that the Board of Patent Appeals and Interferences reverse the rejection by the Examiner and mandate the allowance of Claims 1, 3-9, 11 and 12.

Respectfully submitted,



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Appendix I - Claims on Appeal

1. An active matrix OLED flat-panel display, comprising:

a) a plurality of light emitting elements and associated control circuits;

b) a programmable power supply connected to the control circuits;

c) a sensor for sensing the light output of one or more light emitting elements to produce a feedback signal; and

d) a display controller responsive to the feedback signal for programming the programmable power supply to compensate for changes in the light output from the light emitting elements.

2. The display claimed in claim 1, wherein the display is a color display having light emitting elements for emitting different colors, and further comprising a separate sensor for each color emitted by the display.

3. The display claimed in claim 1, further comprising separate programmable power supplies for each color in the flat-panel display.

4. The display claimed in claim 1, wherein the programmable power supply is on a common substrate with the display.

5. The display claimed in claim 1, wherein the programmable power supply is on a separate substrate from the display.

6. The display claimed in claim 1, wherein the programmable power supply is in a common package with the display.

7. The display claimed in claim 1, wherein the programmable power supply is in a separate package from the display.

8. The display claimed in claim 1, wherein the programmable power supply is addressable as a storage element.

9. A method of controlling an active matrix OLED flat-panel display having a plurality of light emitting elements and associated control circuits, comprising the steps of:

a) providing a programmable power supply connected to the control circuits;

b) sensing the light output of one or more light emitting elements to produce a feedback signal; and

c) programming the programmable power supply in response to the feedback signal to compensate for changes in the light output from the light emitting elements.

10. The method claimed in claim 9, wherein the display is a color display having differently colored light emitting elements and further comprising the steps of providing a programmable power supply for each color, sensing the light output for each color and programming the respective power supplies in response to the respective feedback signals.

11. The method claimed in claim 9, wherein the display includes a controller having a lookup table for receiving device independent code values and producing device dependent code values and further comprising the step of calibrating the controller by changing the lookup table.

12. The method claimed in claim 9, wherein the display is a color display that includes a controller having a lookup table for receiving device independent code values and producing device dependent code values and further comprising the step of calibrating the controller by changing the lookup table to correct for the color balance of the display.